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sion, and advisory engineer, commission for the equitable distribution of the waters of the Rio Grande, takes up the problem of how much space a given weight of river-borne silt will occupy when deposited in a reservoir, saying, on pages 11 and 12:

It was evident that the per cent. of bulk, obtained from test tubes, would be too large for the desired unit because there was no weight on the silt in the tube to compact it, as there would be in a reservoir. . . .

Something more than guesswork was wanted. It did not seem proper to us to found all our silt calculations on an assumed bulk for it which was, as it were, simply pulled out of the air. The desire was to approximate as closely as possible to the conditions which would be found in the bottom of a reservoir. After considering various schemes, to all of which there seemed to be valid objections, it was finally decided to seek a mud bar in the river where the water had been comparatively still and which had shrunk enough to show material cracks, and to cut from this bar a three-inch cube, have it dried out and weighed and to abide by the result, whatever it was. The idea was that a bar should be chosen which had shrunk enough to make up for the compression which the silt in the bottom of a reservoir would undergo from the weight of the water over it. Of course, the necessary amount of shrinkage could not be told exactly, but it was thought that a fairly good guess could be made.

The three-inch cube was collected, dried and found to weigh 85 per cent. as much as a three-inch cube of water. It was, therefore, assumed that "the above experiment fairly determined the weight of reservoir silt and that all silt determinations should be divided by 0.85 in order to obtain the actual final volume of the silt." The collection of the three-inch cube of silt is further described on page 75 of the report.

The first idea, which seems incorrect, is that deep water through its greater weight makes deposited silt more compact than shallow water. If the pores are filled with water, the pressure must be equal in all directions and the individual particles of silt being practically incompressible, the weight of the water must have negligible effect on the compactness of the silt. If the pores are not filled

with water, but contain some air or other gas, the material would be compressed in proportion to the quantity of gas and the amount of pressure, but it does not seem probable that the compactness of silt is, in general, greatly affected by compression of included gases. It seems more reasonable to suppose that any greater compactness displayed by silt deposited in deep water is due to the arrangement of the particles or a modification of their form, brought about by the great distance traversed in settling, and especially is this true unless it can be shown that such silt expands when taken out of the water.

The second somewhat surprising idea is that one three-inch cube furnishes a better basis for determining the specific gravity of Rio Grande silt than all other available data, both inferential and experimental. If this be correct, there is certainly great need of adding to the available data, for the determination concerning the three-inch cube seems to be a small foundation for the argument and hundreds of computations which are based upon them. The result obtained, namely, that silt free from water weighs only 53 pounds per cubic foot, is considerably below most estimates and means that the material has a pore space of nearly 68 per cent. E. W. SHAW

#### ON PSYCHOLOGY AND MEDICAL EDUCATION<sup>1</sup>

FOLLOWING the symposium on psychology

<sup>1</sup> Report of the Committee of the American Psychological Association. The committee was constituted as follows: Shepherd Ivory Franz, scientific director and psychologist, Government Hospital for the Insane, and professor of physiology, George Washington Medical School, chairman; E. E. Southard, professor of neuropathology, Harvard Medical School, and director of the psychopathic department of the Boston State Hospital, and J. B. Watson, professor of psychology and director of the psychological laboratory, Johns Hopkins University. The scope of the inquiries of the committee was determined by the committee; the present report was written by the chairman, who is responsible for its form and the accuracy of its parts, but all the members of the committee are in accord with the conclusions.

and medical education<sup>2</sup> before the American Psychological Association in December, 1911, a committee was appointed to investigate and to cooperate with other bodies interested in this matter. The first part of this work forms the basis of the present report.

The committee sent to all the known medical schools in the United States and Canada inquiries which would lead to an understanding of the present belief regarding the advisability of including psychology as a required subject for medical students, and which would, at the same time, give facts regarding the teaching of allied subjects in the medical schools. Many of the institutions addressed did not reply to the first letter, and five months later, a second letter, incorporating the same questions, was sent to each school in the United States, which had not previously replied.<sup>3</sup> From the 116 schools in the United States, answers were received from 24 class A+;<sup>4</sup> 31 class A; 11 class B, and 5 class C—71 in all, or 61 per cent. of the total. Answers were not received from a number of the medical colleges which had decided to merge with others or to discontinue, or which are not in good standing with their respective states. These include 3 class A (Baltimore Medical, University of Maryland and Drake); 3 class B (University Medical of Kansas City, Kansas Medical and Birmingham Medical); and 7 class C (Jenner Medical, Herring Medical, Eclectic Medical of Kansas, Ensworth Medical, Willamette Medical, Wisconsin College of Physicians and Surgeons and Milwaukee Medical). In addition, one class C college

<sup>2</sup> *Jour. Amer. Med. Assoc.*, 1912, Vol. 58, 909–921.

<sup>3</sup> Two schools were not written to because their names and addresses were unknown to the committee at the time of the sending of our letters (Southern College of Medicine and Surgery of Atlanta, Georgia, and Chicago Hospital College). No replies were received from the eight Canadian medical colleges.

<sup>4</sup> The classification of schools in the present report has been taken from the "Classified List of Medical Colleges in the United States," revised to April 1, 1913, by the Council on Medical Education of the American Medical Association.

(Eclectic Medical of New York) advised us of its suspension. Assuming that these institutions would have no special interest in the matters of which we inquired, or, on account of merging or discontinuation, could not give definite answers to the questions, it leaves 102 American medical colleges from which answers to our inquiries might have been expected. The total of 71 answers represents, therefore, replies from over two thirds of the presumably active medical schools in this country. In many cases, individual questions were not answered by the medical college authorities and only in a comparatively few cases were the replies full and complete. It is a notable fact that the full answers were received mainly from class A+ medical colleges, which, as is well known, are integral parts of universities. With but few exceptions the answers from B and C medical colleges were most unsatisfactory as regards completeness.

TABLE I

*Classes of Schools Answering Inquiries*

Classes	Total Numbers	Answered	Suspended, Merged	Per Cent of Expected Replies
A+	24	24	0	100
A	41	31	3	82
B	24	11	3	52
C	27 <sup>5</sup>	5	8	26
Totals	116	71	14	70

The accompanying table shows the numbers of medical schools of the different classes, the number in each class answering our inquiries and the number of replies in each class which was not expected on account of mergers, etc., as indicated above. This table is an important indicator of the quality of the data used in making up the present report. Since the committee did not ask for the privilege of printing under the individual school names the data and opinions furnished to it, an arbitrary number has been assigned to each reporting school, from 1 to 24 to class A+ schools; 25 to 53 and 70 and 71 to class A schools; 54 to 64 to class B schools, and 65 to 69 to class C schools.

<sup>5</sup> Two others not written to (see above).

We wish to express our appreciation to the deans and professors of these medical schools for their replies, which were often extensive and showed painstaking interest. Without the cooperation and interest of these medical school officials, the present report would not be possible.<sup>6</sup>

The committee requested information along five lines. The special questions which were asked are given below as the heads of the individual sections of the report. It will be noted that matters regarding which inquiries were made were not entirely or strictly psychological. Since psychology has many connections with, and the understanding of many of its topics or divisions depends upon a certain amount of knowledge of, anatomy, physiology, pathology, neurology and psychiatry, the inquiries were broad enough to include informa-

<sup>6</sup> A list of the medical schools which did not answer the two letters of inquiry which were sent to them is of some interest, since in general it would appear to indicate a lack of interest on the part of these school authorities (there may be exceptions) in educational topics which have more than local application. It is notable that all of class A+ answered our letters. The A class schools which did not answer are: Jefferson, Meharry, University of Louisville, University of Mississippi, University of Vermont, Vanderbilt University, Wake Forest Medical Schools. Of the B class, the following: Atlanta School of Medicine, Baylor University, Chicago College of Medicine and Surgery, College of Physicians and Surgeons of Los Angeles, Detroit College of Medicine, Eclectic Medical College of Cincinnati, Hahnemann Medical College of Chicago, John A. Creighton Medical College, University of Arkansas, University of Oklahoma. Of C class, there were the following: College of Physicians and Surgeons of San Francisco, College of Medical Evangelists, California Eclectic Medical College, Georgia College of Eclectic Medicine and Surgery, American Medical of St. Louis, Kansas Hahnemann Medical College, Cotner University, Toledo Medical College, New York Medical College for Women, Leonard Medical College, Cleveland-Pulte Medical College, Fort Worth College of Medicine, Lincoln Memorial University, University of West Tennessee. Some of these schools have more recently announced discontinuation.

tion regarding certain aspects of these courses so that there might be considered the possible relations they might have to instruction in psychology. The inquiries were also made broad because the general medical conception of psychology is not that of the professional psychologist and psychiatrist, as some of the answers showed. In fact in some answers a very narrow conception of psychology was indicated; this, too, by men, well known in their own special fields, who were apparently laboring under the belief that psychology is the equivalent of "psychoanalysis" or some other equally restricted part of the whole.

1. What amounts of time and what proportions of the courses in anatomy (including histology), physiology and pathology are devoted to the nervous system?

The individual answers to this question were on the whole unsatisfactory. Many of the colleges reported the numbers of hours without the percentages, others gave the percentages without the numbers of hours, and in only a few cases was the information complete. A tabular account of the answers is given in the accompanying table (Table II.).

TABLE II

*Average Amounts and Proportions of Courses devoted to the Consideration of the Nervous System*

	Hours	No. of Answers	Percentages	No. of Answers
Anatomy	123	26	17.5	17
Physiology	71	31	22.5	22
Pathology	30	22	12.3	18

In this table the data are grouped irrespective of the fullness of the answers. For example, all answers which gave the total time for the consideration of the nervous system are grouped, and all those which gave proportions.

*Anatomy of the Nervous System.*—Only 12 schools gave both hours and percentages for anatomy and histology, and when these schools are considered apart, it is found that they average for the nervous system, 127 hours, or 14.5 per cent. of the average total time devoted to these courses. The average total for these 12 schools is, therefore, not far from the

general average of the 26, but the average percentage is much less. The variation from the average percentage (about 20 per cent.) is probably due to the fact that the 5 other schools reported their proportions in round numbers, as one fifth, one quarter, one third, and these should probably be considered estimates and not actual reports. It is important to note that the actual variations are considerable, the lowest numbers of reported hours being 54 (26),<sup>†</sup> 55 (30) and 60 (43); the highest, 246 (53), 192 (6) and 185 (16). The percentages also vary greatly; from 8 (43) and 9.1 (1) to 33.3 (33) and 32 (5).

It is possible that the different schools have not reported or estimated amounts of time for the same thing. It appears improbable that only 55 or 60 hours are devoted to the anatomy of the central and peripheral nervous system, as have been reported, and it does appear probable that in the schools reporting the lowest number of hours, no estimation has been made of the time devoted to dissection of the peripheral nervous system or to the special sense organs. While the last statement should not be considered as one of fact, it seems to us that the understanding of the connotation of the term "nervous system" varies from school to school. It is impossible to make allowances or estimations for the possible lack of understanding of the broad term which we used, but we believe that it would be safe to add at least 30 hours to many of the lowest estimates, and these additions would increase the general average by about 15.

*Physiology of the Nervous System.*—Thirteen of the schools reported less than 50 hours devoted to the physiology of the nervous system, 12 from 51 to 100 hours, and only 6 reported 100 hours or more. The lowest totals were 18 (28) and 20 (48); the highest were 150 (13, 30) and 139 (58). The percentage variations were from 11 (34) to 45 (5). Eleven schools reported both amounts of time and proportions; these averaged 64 hours and 23.4 per cent., which are close to the general averages noted in Table II. Some of these wide variations

<sup>†</sup>These italic figures, it will be remembered, refer to individual schools.

are also probably to be explained by differences in conception of what was meant by the term "nervous system." It is not reasonable to suppose that a department of physiology devotes, as was reported by school 2, only 22 hours out of 194 to this subject, which, if considered to include only the central nervous system and the special senses, takes up one third or more of the space of our modern text-books of physiology. On the other hand, it must be remembered also, as several answers indicated, that the time devoted to such topics as the nervous control of respiratory and intestinal movements can not readily be calculated. A careful count of two widely used text-books of physiology shows that, leaving out the parts devoted to the general physiology of muscular contraction, but including those dealing with the general physiology of nerve and the nervous control of various organs, the total physiological text-book consideration of the nervous system is from 39.5 per cent. to 32 per cent. When it is realized that in most medical schools there are separate departments of physiological chemistry, and that the two books examined give, respectively, about 4 per cent. and 18 per cent. of their space to this matter, it appears probable that there has been a tendency on the part of the medical school officers to make an underestimation of the time given to the nervous system rather than the reverse.

Moreover, the inclusion of pharmacology with physiology was not thought of by the committee, but it is apparent that in many institutions the study of the effects of drugs on the nervous system receives considerable attention. In some schools pharmacology (or pharmacodynamics) is taught in combination with physiology, and, in fact, one school reported that of the time devoted to "physiology, pharmacology and physiological chemistry," 20 per cent. to 25 per cent. was given to the nervous system.

*Pathology of the Nervous System.*—From the data collected it also appears probable that under the term "pathology" different colleges include different courses. One school (16), for example, reported the proportion for the

combined "course in pathology, bacteriology and hygiene." In seven cases in which information was given by which the total time of the course in pathology could be calculated, it appears that the total time devoted to pathology varies from 126 hours (12) to 316 hours (47), with an average time of 249 hours. It is certain, however, that in the course in pathology in some medical schools only the more general conditions are dealt with, and that lectures on the pathology of nervous diseases are given in conjunction with those on the clinical aspects. Because of the latter condition, in some of the replies it was stated that it was impossible to give accurate figures, or even to estimate the amount or proportion, of the time devoted to the pathology of the nervous system. From Table II., however, it will be noted that 22 answers were received giving the amounts of time, average 30 hours; and 18 giving the proportions of time, average 12.3 per cent. The variations from these figures are as extensive as in anatomy and physiology. The smallest amount of time reported to us was 5 hours (30), the greatest, 60+ hours (15). The smallest percentage was 2 (42), and the greatest, 25 (27). The seven schools which reported sufficiently full information for accurate calculation of total and proportionate times gave averages of 33 hours and 13.5 per cent.

*Total Time Devoted to the General Study of the Nervous System.*—By adding together the average amounts of time in anatomy, physiology and pathology, we find that approximately 224 hours are devoted to the general study of the nervous system. In most institutions, this is part of the first two years' work; and since the yearly total of hours is usually between 1,000 and 1,200, it is seen that practically one tenth of the total time during the first two years is devoted to discussion and laboratory teaching of this important system. For comparison with the sum of the average times given to the nervous system in the three subjects, the answers from 16 schools (9 A+, 5 A and 2 B) which gave the times for all three subjects are of interest. Although the schools varied from 109 (26) to

317 hours (16), the average, 214, approaches the above figures.\* The possibilities which were noted above, of underestimation of time in regard to each of the three subjects, must also be kept in mind, and if our beliefs in this regard have any validity, it must be concluded that fully ten per cent., and probably as much as fifteen per cent., of the total time of the first two years in medical schools is devoted to the study of the nervous system.

From personal acquaintance with the content of individual courses in anatomy and physiology, it is certain that many lecturers in both subjects discuss psychological matters and an examination of text-books of physiology shows that a considerable part of the space devoted to the "physiology of the nervous system" deals with what is now recognized as psychology. In this connection it is only necessary to point out that the method of working of the cerebral cells is not understood and that, because of this, physiologists describe the mental changes which are concomitants of injuries to or destructions of cerebral cells and connections. In the teaching of the functions of the nervous system, and especially of those of the special sense organs, much psychology (sometimes antiquated, to be sure) is introduced in lieu of strict psychology.<sup>9</sup>

From knowledge of individual courses and text-books, the committee believes that at the present time there is more psychology taught in medical schools than the catalogues of the institutions, or the replies to our letters would indicate. Much of this is dealt with in the

\* One school (32) reported a total in all three courses of 460 hours. This figure was not used in the above calculation because the amounts of time for the individual subjects were not noted.

<sup>9</sup> The committee does not wish to initiate a discussion regarding the boundaries between and the fields of psychology and physiology. It assumes a certain general agreement regarding these matters which may be expressed briefly by the statements that psychology deals with mental matters (sensations, associations, etc.) and that physiology deals chiefly with the activities of cells or organs, and the interrelations of these.

courses in physiology, but even in anatomy and pathology lecturers do not entirely confine themselves to the discussion of non-psychological matters. While it may be possible to teach anatomy, physiology and pathology without reference to psychological matters, in practise this is probably rarely done. In considering the present status of psychology in the medical curriculum, account should, therefore, be taken of the inclusion in anatomy of a modicum of psychology and in dealing with such matters as sensation, perception, etc., the lack of strict separation of psychological facts and theories from those of a physiological nature.

2. How far do the third (or fourth) year courses in nervous and mental diseases take up the biological sides of neurology and psychiatry?

From the answers which were received, it is apparent that this question was quite generally not understood. The fact that it was not understood does, however, give some information regarding the teaching of neurology and psychiatry. Of the 57 answers, 27 were "no"; 24 were of a doubtful character, and only 6 were definitely positive. Careful reading of the doubtful answers shows that 16 of these should be grouped with the definitely "no" replies. The fullest replies, which were received from the professors of neurology in schools 30 and 37, indicate plainly that their teaching of psychiatry and neurology is broadly biological, and not the narrow clinical teaching which characterizes so many of these courses. It is also apparent that in a very large proportion of our medical schools, neurology and psychiatry are taught as clinical subjects—diseases are described, differential diagnostic signs are discussed and methods of treatment are suggested. The broader aspects of these subjects are apparently not even hinted at in many schools, although a superficial reading of many of the answers which were received might lead to the opposite conclusion. Thus we read:

"All work in neurology and psychiatry is biological. I know of no other kind" (25); "Three months" (57); "15 lectures" (66).

It will be appreciated that answers such as the latter two indicate either a lack of understanding of what is meant by the "biological sides" of neurology and psychiatry, or there has been an unwarranted exaggeration of the amount of time given to this part of the subject.

3. Are there elective or graduate courses in medicine which deal with the relations of neurology, psychiatry and psychology, and how much time is given to them?

Only two schools (3 and 23) out of 60 which answered this question replied in the affirmative. School 23 reported an elective course, but gave no other information regarding it. School 3 reported a course of 6 hours on the relations of psychology and neurology. Another school (4) reported an "optional course, with internship in hospital," and a fourth school (43) an "elective course of 32 hours, junior year." The remainder were negative.

It is apparent that students and graduates in medicine who incline toward practise in diseases of the mind and nervous system have few or no opportunities in the medical schools of this country to acquire a broader acquaintance with the subjects of neurology and psychiatry, than the clinical courses which are offered. It is also true that one seeking information regarding relations between such closely allied subjects as psychiatry, neurology and psychology must turn from the medical schools to some other source. At times, courses have been given in connection with psychiatric institutes or hospitals for the insane to fit their own appointees for the work they may be expected to perform, for it is notorious that the internes entering hospitals for the insane are not only ignorant of the facts of neurology and psychiatry and are unable to make diagnoses except in the simplest cases, but that at the same time they do not appreciate any of the possible interrelations of these subjects and that the burden of their special education must be borne by the older members of the staff. With the exception of an apprenticeship in a hospital for the insane, and this is not always adequate, there is at present no possible means of get-

ting an adequate conception of, and training for dealing with, the mass of nervous and mental disorders which is encountered in general practise.

When it is realized that the proportion of insanity is greater than 1:300 of the general population, it is a matter for wonder, and one which those interested in the proper preparation of and training of medical men should study carefully, that the medical schools do not offer adequate means for the acquirement of knowledge along these lines. When, to the number of insane there be added those whose mental conditions are not sufficiently abnormal to order their detention in a hospital for the insane, the wonder grows that the graduate of medicine is able to do more than to appreciate the fact that something is wrong with these patients when they consult him. In relation to the quantity of the physical diseases of the population, *i. e.*, total days of illness, it must be kept in mind that the proportion of the mental diseases is larger than 1:300, for this relation holds for three hundred and sixty-five days in the year. In view of the large proportion of insanity, and to this should be added the non-insane mental disorders and the nervous affections, it is not an exaggeration to say that the courses on insanity and neurology in medical schools are inadequate in time and usually quite unfit in character to prepare the student of medicine for this difficult part of his practise. The student is not prepared to appreciate what mind is, nor the conditions of its alteration, because his preparation in this particular is composed of a few didactic lectures regarding the forms of mental disease, perhaps a few clinical exercises in which patients are shown, and, if the conditions for teaching in hospitals for the insane are good, each student may have an opportunity to talk with a few cases of marked mental disease. At present the teaching of psychiatry appears to be in an earlier stage than surgery was in the two- or three-year course in medicine twenty years ago. How much longer will the medical schools keep psychiatry, neurology and psychology in these dark ages?

4. Is there any correlation or cooperation between the department of psychology in the academic department and the department of neurology and psychiatry in the medical school?

Three schools failed to answer this question in any manner; three others did not answer it because they were "two-year schools," but by their failure to answer for this reason indicated plainly that there was no cooperation or correlation between the medical work and the department of psychology in the college of arts and sciences. Eighteen other schools reported that they had no academic connections; thirty-three definitely reported no cooperation; one gave an unqualified positive answer and the remaining thirteen answered with more than a brief affirmation by giving indications of the character of the cooperation. Of the 52 schools which have affiliations, close or remote, with academic departments, only two sevenths report any form of correlation or cooperation with the department of psychology. Extracts noting the character of the cooperation between the department of psychology and the medical school follow:

"Men from the department of psychology . . . attend lectures and clinics of the professor of psychiatry"; also lectures on diseases of the brain (1).

Next year an instructor in psychiatry "is to give lectures on psychopathology in the academic department . . . otherwise, cooperation is unofficial though fairly strong" (3).

"The department of psychology . . . delivers a series of lectures in conjunction with the department of medicine and presents clinics at the insane hospital" (4).

"In the psychological department students take some work in the clinics" (5).

"Some coordination" but no cooperation (6).

"The department of psychology has affiliated all related branches in the medical department with a view of developing the fields cognate with the subject" (*i. e.*, irregular children) (11).

"The department of psychology . . . offers a special course for the medical students" (21).

"The psychology and physiology of the special senses is taught by a professor in the academic department" (24).

"None except to borrow apparatus" (45).



"Students are expected to select . . . one course in psychology during the preliminary year" (46).

"Psychology has been . . . placed in the second year of medical work" (49).

"Students in the two years of (premedical) work . . . are required to take two terms of three hours a week of general psychology. . . . Working upon the basis of closer contact and cooperation" (50).

It will be noted that not more than one half of these answers indicate any definite form of cooperation or correlation. At the most, the replies show that in some institutions academic students who are interested in psychological matters may attend certain courses in the medical school, and that in other institutions medical students are advised or compelled to take courses in psychology. It may be concluded that in this respect there is more promise than accomplishment.

5. In view of the increasing realization of the importance of the mental factor in medicine, is it your opinion that (a) it would be advisable to have given to the students special instruction in psychology, and, if so, (b) at what stage of the medical course would this instruction be best given?

Only 4 of the 71 medical schools failed to answer the first part of this question. The numbers and percentages of the different replies are as follows: 49 affirmative (73 per cent.); 8 negative (12 per cent.); 10 qualified affirmative or negative (15 per cent.). The percentages of affirmative and negative answers from the four classes of schools (A+, A, B and C) are approximately the same, being, respectively, 71, 72, 80 and 75.

After the first few answers were received, it was the supposition of the committee that those schools which had no academic connections would be less in favor of introducing into the medical school a subject which might necessitate the employment of a special instructor, but the full data indicate that the percentage (65) of affirmative replies from these schools varies but little from that (76) of the schools which have close academic ties. The answers to this question can not be well tabulated except in the rough form which is

given above, but for an understanding of the beliefs regarding the advisability of introducing psychology into the medical school curriculum, or into the preparatory period of training, it is advisable to give brief extracts from some of the answers which were received. These will be taken up in the following order: negative, doubtful, affirmative.

In a few cases the negative answers were accompanied by some expression of view in addition to the simple "no." Some of these answers are interesting because of the apparent beliefs of certain medical men regarding the scope and recent developments of psychology, and are recorded here, because they serve to indicate that some of the apparent objections to the introduction of psychology into the course for medical students may be based upon ignorance or misapprehension of what the term psychology connotes.

"The professor of neurology . . . thinks it is a temporary fad which will be forgotten in a few years, just as electricity is now practically forgotten in the treatment of nervous diseases" (1).

"I doubt very much if information in formal psychology, I mean psychology in the older sense, is of very much use to the medical student" (18).

"I am not in favor of teaching psychology in the medical college. I believe that the wave of so-called psychology which has spread over medical literature during the past ten years is not worthy of the name and has been a distinct injury to medical science. It is in my opinion very erroneous and misleading. None more so than Dr. Morton Prince's and Dr. Freud's" (25).

The two following quotations are also of interest as negative answers:

"No unanimity of opinion among the faculty members. I personally am of the opinion that the experiment might well be tried by some of the larger university medical departments" (20).

"We do not think it would be advisable to include psychology in the medical curriculum. All of our students must be graduates in arts and sciences before entering the medical school and these courses usually include psychology, logic, philosophy, etc." (2).<sup>10</sup>

<sup>10</sup> In a conversation with the professor of psychiatry of this medical school, it was learned that this view was not the one held by him, and he

The following are some of the answers which, while not decisively positive or negative, but at the same time not favoring the introduction of psychology into the medical school curriculum or as a requirement for entrance, modify the statements in certain particulars.

"While we consider that it would be desirable to give special instruction in psychology, especially in the fourth year, we do not at the present time see how time could be found for it" (12).

"Yes; but it is hardly feasible in the immediate future" (35).

"It would be desirable for the students to be taught psychology, but on account of the fact that it is only a four-year course and other subjects being more important and requiring all the students' time, as the course is now arranged, it is not probable that we shall be able to establish a separate course in psychology. If it were introduced it would be best to have it in the third year" (54).

"I believe it is very undesirable to add more to the medical curriculum. . . . It seems to me that it would be better to urge students to study psychology in the premedical college course" (19).

"It seems doubtful if instruction in psychology can be introduced into the already crowded undergraduate course. Elementary instruction in psychology is desirable as a preliminary study, though it is not possible to require it at present. It is improbable that psychology can be introduced as a required subject. An optional course might be profitably given" (22).

"It would seem that nothing should be added to the medical course without an equivalent abstraction. . . . It seems as if psychology was necessary, and, in the light of my previous statements, reported that he did not believe it represented the attitude of the medical departments chiefly concerned. Since this report was typed, the secretary of this school has written correcting the above statement as follows: "As a matter of fact, Professor — is already committed to the advisability of extending his lectures by adding a sufficient course of instruction in advanced normal psychology from the medical standpoint, and the authorities of the college have already expressed their approval of his ideas in this direction." The percentage of affirmative answers is, therefore, increased to 75, and that of the negative answers reduced to 10.

it ought to be taught as a part of . . . preparation" (36).

"I consider it inadvisable at any time to touch more than lightly to the undergraduate body upon the question of psychology. It should, however, be touched, in my opinion, in the final year if taught in the regular course. Personally, I believe that it should be devoted to post-graduate work" (32).

"It would be unwise to add anything further as compulsory work. I think it well to give an optional or post-graduate course for students especially interested" (40).

"The medical curriculum is now overcrowded; this should be graduate work, in my opinion" (45).

Opposed to these negative and doubtful answers others of an equally positive nature have been received. Some of these are as follows:

"Psychology is a desirable study for medical students. Up to date I know of no course in psychology which is particularly adapted to the needs of the medical student. Could instruction in psychology be given by a trained psychiatrist rather than a pure psychologist, time could probably be found for such a course in the medical curriculum" (6).

"Instruction in psychology is not merely advisable . . . but necessary, and such instruction should be at least partially premedical, and should be developed practically and logically later in the medical course in the departments of neurology and psychiatry" (8).

"We have felt for a long time that psychology was most important as a preparation for the study and practise of medicine" (9).

"My observation in regard to those who write in medical journals on the subject (psychiatry) would seem to indicate that they had had no competent preparation in psychology. . . . I have recommended that one of the professors in the department of psychology who is trained in the physiology and pathology of the brain and nervous system give a course in the college of medicine preliminary to the study of psychiatry" (10).

"I thoroughly agree with the importance of special instruction in psychology in the broad scope which your inquiries would indicate and I should be glad to have any information which would lead to the possibility of the establishment of a systematic course in the subject" (11).

"The demands of modern medicine require an elementary course in medical psychology to be given in the medical department . . . (to) be carried out under the direction of the department of nervous and mental diseases. . . in the second year after the work in anatomy and physiology of the nervous system" (16).

"Psychology is of such importance in medicine that a course in general psychology should be recognized as one of the fundamentals, and should be required as a part of the college work required for entrance. Further instruction in applied psychology should form a part of the clinical work in connection with mental and nervous diseases" (17).

"I believe that special instruction in psychology should be given medical students . . . (not) the traditional introspective aspects of the subject . . . but psychology for medical students ought to be as concrete and objective as possible" (21).

"I am decidedly of the opinion that students should receive instruction in normal psychology . . . such instruction should be given as part of the course in physiology in those institutions in which one of the professors in physiology were sufficiently familiar with the subject" (58).

It should also be noted that 10 medical schools have already introduced (or plan to introduce next year) psychology into the curriculum or require it for entrance, and one advises students to take a course in psychology in the preparatory premedical years. Quotations from these replies follow:

"In the . . . second year the students are to be given a course in psychology as an extension of their anatomical and physiological course in the medically important topics of psychology . . . in the . . . third year a course of . . . lectures and demonstrations covers the essentials of experimental and clinical psychopathology" (5).

"Psychology is recommended as preparatory to the study of medicine" (15).

"Beginning next year, psychology prescribed during second of the two collegiate years required for entrance" (29).

"Instruction in psychology is given to students in their second year of collegiate work. We hope to have a course in medical psychology for senior students" (30).

"Psychology has been removed from the second premedical year and placed in the second year of medical work" (49).

"A full course in physiological psychology extending throughout the year is given to the sophomores. . . The course prepares the students for the instruction in neurology and psychiatry" (56).

"Ours (*i. e.*, course in psychology) is given during the latter part of the session, but it seems to me that a large (part of the) time that is devoted to pharmacology and materia medica could be more profitably spent in neurophysiology and psychology" (62).

"I give the students a preliminary course of normal psychology and then take up pathological psychology" (64).

"We have a course, 32 hours to sophomores, in psychology" (65).

"I have been teaching applied psychology . . . for the last three years . . . not . . . the usual psychology taught in academic departments, but psychology as it applies to the normal and then to the neurotic. . . In my own opinion most of the so-called psychological courses given are worthless . . . purely academic in nature, and no application whatever is made to their every-day uses" (70).

Of the 49 schools which indicated their belief that psychology should be introduced into the medical curriculum, 47 have also indicated the position that such work should occupy. Of these schools, 27 advise that it be placed in the medical preparatory years or in the first two years of the medical courses, and the other 20 stated that it should be given in the final years. Most of the latter insisted that its place was a part of, or as a special preparation for, the work in nervous and mental diseases. Of the 27 schools which advised the introduction of psychology into the first part of the course or into the years of medical preparation, 12 refer, explicitly or by implication, to the dependence of psychology upon the facts of anatomy and physiology, and advise its introduction at a time when the courses in the anatomy and physiology of the nervous system are being given or after they have been completed. Although admitting its value, 4 would dismiss psychology by including it as a required course in the premedical years. The other 11 schools advise that a second course be given during the third or fourth years in addition to the require-

ment of the first years of the medical work. They would divide the instruction in psychology into two portions, the first to be offered to students during the first part (including the premedical years) of the medical course, the second during the last two years of the curriculum. In the first course in psychology only the general outline of the subject would be given, in the second particular attention would be paid to its "special medical meanings." The latter, dealing with the applications of psychology, would be given previous to, or coordinate with, the courses in clinical neurology and psychiatry.

Relative to the above results the committee may at this point answer a possible question regarding them. It may properly be asked if the results do not represent chiefly the opinions of professors of neurology and psychiatry, who are supposed to have a special interest in psychological matters, and not those of other members of the medical faculties. All of our letters of inquiry were addressed to deans or other administrative officers of the medical schools. In a number of instances the letters of the committee were transmitted to other members of the faculty for answer. It is probably due to this fact that in a number of cases complete answers were not received, for the member of the faculty to whom the letter was transmitted sometimes answered only that part relative to his department. In many cases the deans obtained the full information from the members of the departments concerned, and transmitted all information, at times with great fullness, to us. In the answers to our question 5, only 19 of the 67 replies were answers by, or contained quotations of opinions of, professors of neurology and psychiatry. An equal number were answers from the administrative officers, dean or secretary, whose special medical interests could not be determined<sup>11</sup> (but probably representing the views of their faculties). The re-

<sup>11</sup> Catalogues of the institutions were not at hand, and reference was made to "American Men of Science" and to "Who's Who in America," 1912-13. The names of these 19 correspondents were not found in either directory.

maining 29 were from deans and other administrative officers whose primary medical interests were distributed over a wide field; 4 in physiology, 4 in pathology, 11 in medicine, 1 in surgery, 1 in hygiene and 8 in anatomy. The decisively negative answers to this question were received from 5 professors of nervous and mental diseases, 1 of anatomy, and 2 administrative officers; the doubtful answers were received from 2 professors of nervous and mental diseases, 2 of anatomy, 1 each of physiology, medicine and pathology and 3 administrative officers; the positive answers were received from 12 professors of nervous and mental diseases, 5 of anatomy, 3 of physiology, 3 of pathology, 10 of medicine, 1 of surgery, 1 of hygiene and 14 administrative officers whose medical interests are unknown. If all the answers from professors of nervous and mental diseases be omitted because of possible professional bias, the percentage of replies in favor of the introduction of psychology into the period of medical training is 77, which, it will be noted, is slightly in excess of the general percentage.

From the facts which the committee has been able to gather, the following conclusions have been drawn:

1. It appears to be the preponderating opinion both of the best schools and of the schools as a whole, that some instruction in psychology is necessary so that students may understand the mental side of their patients, not only of those which are to be dealt with as insane, but also of many who never reach the extreme conditions which warrant their being sent to an institution for nervous or mental diseases.

2. By those medical schools which require for entrance a college education in arts or sciences, the committee believes that an introductory course in psychology may well be required, in the same way as they now require chemistry, biology, physics, etc. In those schools which do not require a preliminary college training but which require one or two years of college work, the committee believes that part of the premedical preparation should be devoted to general psychology, or in lieu

thereof, a course should be given preferably in the second year after the general work in anatomy and physiology of the nervous system has been completed. The committee believes that a briefer course following the physiology of the nervous system would be more desirable than a course in the premedical years. If the earlier course be more extensive and devote sufficient time to the functions of the nervous system, the advantage of the later course would be counterbalanced.

3. It is the belief of most of the best schools that a second course in psychology should precede the course in clinical psychiatry and neurology. This course should have more of a practical nature, and should deal especially with abnormal mental processes and with the application of psychological principles and facts to medical topics. Although this course should deal chiefly with psychopathology, it should not be permitted to develop, or degenerate, into a course in psychiatry, neurology or psychotherapeutics. This course should be clinical in the sense that, as far as possible, clinical material should be the basis of the course, but it should not be clinical in the sense that the students are given particular cases for the purpose of diagnosis or of treatment. The functions of the courses in psychiatry and neurology should not be assumed by this course.

4. Although, on account of their knowledge of the practical medical application, it might be best if both courses in psychology could be given by competent medical men, the committee feel that there are at present few medical men who have had sufficient training or have sufficient interest in psychology to warrant their appointment to initiate such work. It seems best, therefore, to recommend for those medical schools in which there is a possibility of correlation or cooperation with the department of psychology in the school of arts and sciences, that these courses be given jointly, and cooperatively, by the departments of psychology and psychiatry or neurology.

5. The content of the course or courses in psychology should be the object of careful consideration by representatives or professors of

those subjects which are allied to psychology. The departments which should be chiefly consulted include physiology, psychiatry, psychology and neurology. It is the belief of the committee, however, that since the courses are intended for the preparation of medical men, the courses should be practical and should deal with actual medical facts as much as possible. The committee would not, however, limit the teaching in the elementary courses to those topics which have a known practical medical value at the present time, for it has always been found that facts apparently incapable of application at the time of, and immediately after, their discovery are soon applied. It is our belief, therefore, that the first course in psychology, as introductory to the study of medicine, should be a general course, dealing largely with general psychological facts, standpoints and methods, but that constant reference should be made to the practical problems which may be solved by means of the psychological methods and facts which are discussed. The committee also believes that both courses in psychology should be laboratory or experimental as far as possible, that the student may become personally acquainted with the methods and with the general nature of psychological experimentation, rather than obtain his knowledge from text-books. Although recitations or lectures have great value, they can not give an adequate knowledge of the manifold difficulties which one encounters in dealing with matters of a mental nature.

6. The committee also feels strongly that more extensive and intensive cooperation between psychologists and physicians is desirable. From the psychologist's standpoint the psychology of medical men is crude; from the medical standpoint the pathology and physiology of the psychologist are out of date. Since both classes have many common interests it would appear wise that the knowledge of psychologists should be utilized by physicians and that in turn the experience of more physicians might be made available for the advancement of psychology and psychopathology.

SHEPHERD IVORY FRANZ